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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR OCTOBER 1936

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FRUIT INSECT INVESTIGATIONS

Peach borer does not have 2-year cycle in Georgia.--O. I. Snapp and J. R. Thomson, Fort Valley, Ga., report results of 3 years' observations to determine whether some individuals of Conopia exitiosa Say require 2 years to complete their life cycle. All of the insects under observation completed their life cycle in not more than 1 year, and thus far no evidence has been obtained to indicate that under Georgia conditions some individuals of this species may require 2 years.

Infestation in stored raisins.--Samples from a lot of about 20 tons of screened raisins, the season's production from one ranch, taken on the ranch by Perez Simmons and H. C. Donohoe, of the Fresno, Calif., laboratory, in October 1935, indicated a population of 500 larvae of the raisin moth (Ephestia figulilella Greg.) per ton. The original infestation, before the raisins were passed through a portable electric shaker-screen, developed at the Fresno laboratory, had been about 16,000 raisin-moth larvae and pupae per ton. After storage for 10 months in a typical commercial storage yard, the infestation per ton was found to be about as shown in the following table:

Species	Individuals present after--	
	Screening (Oct. 1935)	Storage 10 months
	Number	Number
Ephestia figulilella Greg. (larvae, pupae)	500	300
Plodia interpunctella Hbn. (larvae, pupae, adults)	0	800
Oryzaephilus surinamensis L. (larvae, pupae, adults)	0	15,000
Tribolium, 2 species (adults)	0	100
Cryptolestes sp. (adults)	0	300
Cephalonomia tarsalis Ashm. (adults)	0	1,000

Experiments to determine population of adult codling moths in apple trees.--E. R. Van Leeuwen, of the Yakima, Wash., laboratory has carried on experiments to determine the population of adults of the codling moth in apple trees, as an aid to the evaluation of field experiments with baits. During the period August 11 to August 25, 11 medium-sized sprayed apple trees were covered with a tent and fumigated with a nicotine dust. In these 11 trees an average of a little more than 6 moths per tree were killed, and it is believed that this figure represents the total number of moths in the trees before the tent was placed in position. During the same period of time 1 pine-tar-oil-molasses bait located 15 rows from the fumigated trees captured an average of 90 moths per night, indicating that the bait was capturing moths from a number of trees in the vicinity. In order to obtain data on the number of moths attracted to a baited tree but not caught in the trap, a sprayed tree containing one molasses bait was fumigated each morning during the period August 5 to August 16. During this period an average of 5 moths was brought down by the fumigant each morning as compared with 62 moths caught in the bait during each evening, indicating further that moths were finding their way to the baits from a number of trees in the vicinity of the trap. An unsprayed tree in an abandoned orchard was also fumigated in the same manner and 122 moths were captured in one fumigation.

Development of immature stages of Japanese beetle in the fall.--In the News Letters for July and August 1936, T. N. Dobbins, Moorestown, N. J., presented summaries of the relative proportions of the various stages of the Japanese beetle represented in the soil population for those months, in comparison with the same periods in 1935. These summaries showed a decided retardation in development during the current season, particularly in the early instars. Surveys made in October showed that the unusual proportion of first instars recorded for July, August, and September persisted during the first 10 days of October. Normally during October in the latitude of Moorestown, less than 1 percent of the soil population occurs as first-larval instars. The marked retardation of larval development, however, did not continue through October, but has apparently been compensated by a much more rapid development, as by the end of October a greater proportion of third instars were entering hibernation even than during the corresponding period in 1935. This somewhat accelerated development seems to be correlated with higher soil temperatures, which were prevalent during the latter part of September and first part of October this year, resulting in a "catching up" of larval development as the hibernation period approached.

Importation of Japanese beetle parasite.--M. H. Brunson, Moorestown, reports on his examination of a shipment of Tiphia popilliavora Roh. (Yokohama strain), received at Moorestown on October 20, 1936, from R. W. Burrell of the Bureau's laboratory at Yokohama, Japan. The shipment consisted of 1,067 field-collected females. When the shipment was received at Moorestown and examined, it was found that 726, or 68 percent, of the parasites were alive, 252, or 23.6 percent were dead, and 89, or 8.3 percent, were unaccounted for. The general condition of the shipment was excellent; therefore it is believed that the mortality can be considered normal for females collected at this season of the year.

The oriental beetle at Springfield, Mass.--I. M. Hawley, of the Springfield, Mass., sublaboratory, reports on the finding of a heavy infestation of larvae of Anomala orientalis Waterh. on the grounds of one of the large insurance companies in Springfield. This is the first instance brought to our attention of heavy infestation by this species in Springfield.

MEXICAN FRUIT FLY CONTROL

Citrus shipping starts in lower Rio Grande.--October 1 marked the opening date for shipment of the 1936-37 citrus crop from the Rio Grande Valley. All indications point to the shipment of the largest crop so far produced in this area. The expected movement is estimated to reach a total of 20,000 cars, if weather and market conditions continue favorable. Excellent progress has been made in obtaining compliance of growers and packers with quarantine regulations. Every available means has been used to acquaint the citrus industry with the necessity of grove and packing-house sanitation and, as a result of these efforts, the industry as a whole is enthusiastic in its support of the program. The shipment of fruit compares favorably with last year's record. Permits were issued during October for the movement of 870 cars by rail and 2,193 loads by truck.

Only one Mexican fruit fly trapped.--Only one Anastrepha ludens Loew was trapped during the month. Through the same period last year 23 adults had been taken from 22 premises. During the same period for the two previous years, however, none had been trapped. It can be seen that the population varies from month to month yearly.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Hessian fly survival favored by local environment.--E. T. Jones, of the Manhattan, Kans., laboratory, reports that a search for wheat stubble infested with hessian fly was made throughout central and southeastern Kansas during June, July, and August. A few very light infestations were found in sheltered spots. The only appreciable infestation discovered was located in stubble at the bottom of a swale in a field on the south side of the Smoky Hill River. It is probable that this swale, which was the result of a highway excavation and was approximately 600 by 30 by 8 feet in size, held sufficient moist air from the river to permit the flies to oviposit and the larvae to migrate during May, when drought conditions elsewhere prohibited reproduction. Representative samples of stubble taken from the bottom and from the upper edge of this swale differed materially in infestation. Each sample consisted of 100 plants, an average of 400 culms. Seventy percent of the plants and 32 percent of the culms taken from the bottom were infested with an intensity of 1.9 puparia per infested culm. Stubble taken from along the upper edge, about 6 feet higher and 20 feet distant, carried a plant infestation of 35 percent, and a tiller infestation of only 13 percent, with an average intensity of 1.4 puparia per tiller. As determined by observation and rough count, the field, exclusive of the swale, had a plant infestation of less than 5 percent. It was burned off before actual infestation could be determined.

Food supply as an inhibiting factor in the fecundity of devastating grasshoppers in dry-land areas.--C. C. Wilson, of the Sacramento, Calif., laboratory, reports a study of the maturation and deposition of eggs has been made of *Melanoplus devastator* Scudd. in the recent outbreak of 1936 in the foothill-grassland habitat in California. Repeated dissections of females, beginning in July and extending to the latter part of October, indicated no development of the ovaries. An egg-pod survey indicated but few adults had deposited eggs, yet the population was estimated at from 5 to 15 per square yard on one area of 1,000 acres. The depleted food supply, which consists largely of wild grasses and tarweed in their natural habitat, seems to be the inhibiting factor in preventing ovarian development of the species. The grasshoppers, although normal in size, were sluggish and easily captured. On further examination, no parasitization was noted and the fat bodies, which were numerous in July, had practically ceased to exist in October. Experiments conducted in Siberia (Rubtzov Bull. Ent. Res. pp. 339-348, Sept. 1934) indicated that the fertility may be reduced 30 to 40 percent by insufficient food. Although the period of observation for the dry-land areas in California is short, it does indicate that scarcity of food is a factor in reproduction and may throw some light on the reason for the reduction of grasshoppers to nonoutbreak proportions.

Resistance of sweet corn to European corn borer.--Morris Schlosberg and Ralph Mathes, Toledo, Ohio, report as follows on results of observations on sweet corn resistance to attack by the European corn borer: Observational tests were conducted near Toledo, Ohio, this year to determine from among available material those inbred strains of sweet corn that may possess resistance to infestation by the European corn borer. Further studies will follow with such strains to determine the characters associated with resistance for use by breeders in developing resistant commercial hybrids. Materials for observation were provided by the following State agricultural experiment stations: Connecticut, Illinois, Iowa, Maryland, Michigan, Minnesota, Ohio, and Indiana (cooperating with the Federal Bureau of Plant Industry). Data were obtained from 111 inbred and 53 hybrid sweet corn strains, tested in quadruplicated plots in randomized blocks. The data include the following: (1) The number of borers per plant per strain resulting from hand infestation with two egg masses per plant; (2) the number of borers per plant resulting from natural infestation; (3) the midtasseling dates of the strains; (4) the midsilking dates of the strains; (5) the mean heights of the strains in inches on July 10, at the time hand infestations were made, and coincident with the peak of natural oviposition; (6) the number of tillers per plant per strain. The borer populations resulting from uniform hand infestation of the plants are the basis for comparing the strains. The data relating to natural infestation and to developmental differences among the strains are essential to account for possible associated influence of these on the borer populations resulting from the hand infestations, as it is impossible to eliminate such differences from the tests where so many strains are involved. Such associated effects may not be attributed to the presence of susceptible or resistant traits. For purpose of analysis, the data were grouped by strain types. By analysis of variance and calculation of the least significant difference between any strain result and the average of all strains of a type, the strains were grouped into significantly low, average, and high population classes. A summary of the number of strains in each class of each type is given below. The range in numbers of borers per plant is also shown.

Type	Total strains	Strains significantly-- Below average	Average	Above average	Borers per plant, per strain Lowest	Average	Highest
	Number	Number	Number	Number	Number	Number	Number
Inbred strains							
Bantam-------------	39	12	17	10	2.92	8.23	14.25
Country Gentleman-	28	8	11	9	1.60	5.46	8.70
Evergreen----------	44	13	21	10	1.58	5.37	11.00
Hybrid strains							
Bantam-------------	22	8	7	7	2.92	7.33	12.42
Country Gentleman-	16	4	10	2	3.42	4.67	7.15
Evergreen----------	15	3	9	3	2.95	4.64	8.00

With reference to the tabulation above, it is not to be inferred that all strains in the significantly low group are borer resistant, nor that all strains in the significantly high group are borer susceptible, as in either case the result may be due to concomitant seasonal influences rather than to inherently resistant or susceptible traits. The low group, however, may be considered the potential source of characters associated with resistance.

Colonization of European corn borer parasites.--W. A. Baker, of the Toledo, Ohio, laboratory, summarizes releases of imported and exotic parasites of the European corn borer for the 1936 season, the releases extending from early in June through the first week in August. The objectives of the current season's program were the distribution of the ichneumonid Inareolata punctoria Roman over as much of the area infested by the corn borer as possible and the testing in the more southern range of the borer of two species of parasites, Cremastus flavoorbitalis (Cameron) and Microgaster tibialis Nees, which had not become permanently established following releases in colder areas. In addition, adults of the braconid Chelonus annulipes Wesm. were made available for release through the cooperation of the Entomological Branch of the Canadian Department of Agriculture and Lydella stabulans var. grisescens R. D. was obtained incident to collections made to procure other species. Thirty-five colonies were released in 10 States, comprising a total of 34,488 adults of five species as tabulated below.

State	Species released					
	I. punctoria	M. tibialis	C. flavoorbitalis	L. stabulans	C. annulipes	Total
	Number	Number	Number	Number	Number	Number
Massachusetts	1,679	--	--	--	--	1,679
Connecticut	--	1,994	--	--	--	1,994
New Jersey	585	1,809	599	810	--	3,803
Maryland	--	--	--	5,365	--	5,365
Virginia	1,188	3,199	2,371	--	2,105	8,863
New York	1,779	--	--	--	--	1,779
Pennsylvania	--	--	--	1,965	--	1,965
Ohio	6,835	--	--	--	--	6,835
Michigan	1,606	--	--	--	--	1,606
Indiana	599	--	--	--	--	599
Total	14,271	7,002	2,970	8,140	2,105	34,488

Parasitization of European corn borer in Massachusetts.--C. A. Clark and E. D. Burgess, Moorestown, N. J., report that during an examination of cornfields in the vicinity of Malden, Mass., in order to determine their suitability as a source of supply for adults of I. punctoria for 1937 releases in noncolonized sections of the corn borer infested area, an average total parasitization of 24 percent prevailed in the 15 fields observed--22 percent by I. punctoria and 2 percent by L. stabulans var. grisescens.

Certain varieties of wheat show resistance to hessian fly in Indiana.--C. M. Packard, Lafayette, Ind., reports that out of about 2,400 wheat varieties, selections, and hybrids examined for spring infestation, Variety F. P. I. 94587, Marquillo, Marvel, and 5 selections and 11 hybrids of Illinois No. 1 show high resistance. With some of these as parents the breeding of fly-resistant wheats suitable to the soft-winter-wheat region is in progress in cooperation with the plant breeders at Purdue. Illinois No. 1 selections and F. P. I. 94587 have also shown resistance in other States than Indiana.

Chinch bug repellents and attrahents.--Mr. Packard reports that a total of 211 essential oils and other odorous chemicals were tested during the summer for their attractiveness to chinch bugs by himself, Curtis Benton, E. V. Walter, and W. B. Noble. None of the chemicals showed particular attractiveness to chinch bugs, but certain ones would appear to be definitely attractive to Diabrotica 12-punctata Fab., flea beetles, Orius insidiosus, or pomace flies. Materials showing attractiveness in these preliminary trials are indicated below:

D. 12-punctata:
- Anise oil
- Anisitic aldehyde, synthetic
- Anisaldehyde
- Anisique alcohol
- Benzyl acetate
- Benzylic alcohol
- Benzyl butyrate
- Cannamic alcohol
- Cinnamaldehyde
- Cymene-p
- Styrax oil

Flea beetles:
Thyme, red oil of
Thyme, white oil of
Thymene

Orius insidiosus:
Spike, oil of

Pomace flies:
Anisic aldehyde, synthetic
Anethol
Asafoetida oil
Iso valeric acid

In tests made to determine the repellency of this list of chemicals to chinch bugs, the preliminary test showed definitely that most of the chemicals were only slightly or not at all repellent. A total of 34, however, appeared to be strongly repellent. One or two apparently turned back the bugs one-half an inch or more before they reached the chemicals. Although more conclusive tests are necessary the following might be mentioned as showing more promise of repellents: Ajowan, oil of citronella, pine-needle oil, pine-tar oil, and savory oil. Late in September the 34 chemicals showing most promise as repellents in the July tests and the 9 additional materials, including ammonia, were tried on corn in which the bugs, mostly adults, were numerous and congregated mainly under the leaf sheaths. A single infested stalk was treated with each chemical by inserting a small impregnated pad of cotton under each leaf sheath. Nine check stalks were similarly treated with cotton pads bearing no chemical. Subsequent examinations showed the bugs to be still numerous under the sheaths of the checks and many of the chemically treated plants. Eleven of the 43 chemicals, however, appeared to be not only highly repellent but also lasting, notwithstanding the 3.15 inches of rain that fell between the first and last observations, as shown in the following table, accurate counts being impossible without removing leaf sheaths and thus spoiling the experiment.

Chemical applied	Bugs present after--		Odor after
Sept. 23	24 hours	8 days	8 days
Carvone	None	Very few	Moderate
Celery seed oil	do.	do.	Strong
Cedar leaf oil	do.	do.	Moderate
Cymene-p	do.	Few	Faint
Dill, oil of	do.	None	Moderate
Fennel oil	do.	do.	Strong
Galbanum oil	do.	do.	Moderate
Hemlock oil	do.	do.	Strong
Pnthalol	do.	Very few	None
Rue geranium, oil of	do.	None	Moderate
Rue, oil of	do.	do.	Do.
Nine checks	Many	Many	--

Twenty-two additional chemicals appeared to be highly repellent, though not equal to those above. The odors of most of these were also very persistent.

Conocephalus (Xiphidium) fasciatus (de Geer) as a pest of bentgrass.--L. P. Rockwood, of the Forest Grove, Oreg., laboratory, reports that there has been complaint of serious damage to bentgrass meadows in Klamath County in 1935 and 1936 by this little green locustid. Observations on July 27, August 7, and August 25 confirmed the report that this species damaged the seed heads of bentgrass and yielded some information on habits and possible control methods. As there is very little known of the oviposition habits of these locustids, a special effort was made to observe oviposition or to find eggs in the meadows. In this we were unsuccessful, but it is thought that most of our observations were too early for the main oviposition period. *Conocephalus* were observed to feed on the spikelets of bentgrass in July and August and examination of many bentgrass heads showed that little seed occurred in the most heavily infested fields of Astoria bentgrass. Heads of foxtail were also bitten into. *Conocephalus* was greatly aided in this damage to the bentgrass seed crop by the work of a noctuid larva, *Polia liquida* Grote, which attacked the heads in a similar way. The two species together caused a loss of $25,000 worth of bentgrass seed, according to the owner.

JAPANESE BEETLE CONTROL

Brisk trade in nursery stock increases inspection demands.--Favorable weather conditions in the Baltimore district enabled nursery establishments to continue their plantings and to fill practically all orders on hand. Orders for nursery stock received for fall and spring planting showed a substantial increase over previous years. There was a noticeable demand for the better grades of stock. This was attributed to the large number of finer homes now under construction in the Baltimore district. In the Pittsburgh district a number of greenhouse men experienced difficulty in meeting the demands for newly introduced varieties. During the past year three establishments in western Pennsylvania have developed new plants that are in great demand. One establishment informed our inspector that they have booked orders, which cannot be filled, for 200,000 geraniums in 2¼-inch pots. Other classified nurserymen in that section report that previous one- and two-plant sales have developed into large orders, and that many home owners who previously made their own plantings are now having the nurserymen perform the landscaping work. This stimulated nursery activitiy has required maximum efforts by the available inspection force to meet the current demands for inspection and certification.

U. S. Army repulses beetles at Fort Jay.--One hundred Japanese beetle traps distributed on Governor's Island in New York Harbor caught 144½ quarts, or approximately 145,000 beetles, between July 29 and September 12. The traps were placed too late to catch the beetles while the heaviest flight was on. Catches were negligible after August 30. The Army officials at Fort Jay made arrangements for the placing of the traps following a heavy beetle flight which reached the nuisance stage and proved of considerable annoyance to those engaged in the ordinary activities on the island. Next summer it is the intention of the officer in charge of the placing and tending of the traps to have them set and baited in time to capture the beetles emerging early.

District supervisor assists in organizing North Carolina work.--H. B. Ward, district supervisor in charge of the Richmond, Va., Japanese beetle office, spent 2 weeks assisting R. W. Leiby and State Inspector J. T. Page in the organization of the work involved in the enforcement of the North Carolina State Japanese beetle regulations. Many of the nursery and greenhouse establishments in the affected areas were visited and the regulations were explained. It was learned from the proprietors of the establishments that very few quarantined commodities are moved from the restricted zone.

Chemical treatments under way.--Early in October many classified nurseries began treatments of nursery stock with carbon disulphide emulsion. One nursery that originally planned extensive treatments with paradichlorobenzene switched to the carbon disulphide treatment as offering more satisfactory results in the disinfection of plants for forcing. A number of nurseries are experimenting with paradichlorobenzene to determine its effect on the plants they wish to ship.

Conviction secured for misuse of certificate.--After entering a plea of guilty to an information filed in the United States District Court in New York City, alleging a violation of the Plant Quarantine Act arising from the misuse of a Japanese beetle quarantine certificate in connection with a large shipment of uncertified palms and ivy plants destined to Miami, Fla., the Fight Floral Company, Inc., plant brokers of New York City, were fined $50.

Sand certification increases.--Shipments of certified sand from southern New Jersey exceeded those of any fall season for 6 or 7 years. Three and sometimes four inspectors were required for the supervision of sand pits desiring certification. Eighty-five cars of molding sand were certified in a 2-week period. Shipments of sand from the New Cumberland, Pa., district to manufacturers of safety glass also increased.

Actual inspection required of enormous quantities of strawberry plants.--Infestations of the Japanese beetle were found this summer on a number of important strawberry-plant-producing farms on the Eastern Shore of Maryland. The approximate number of plants that lost their preferred status with the finding of these infested growing units is estimated at 14,000,000 strawberry plants, 550,000 grapevines, and 400,000 black raspberries.

Cut-flower quarantine lifted.--Cut-flower inspection, carried on till the maximum date provided for in the regulations, was terminated after October 15. In Philadelphia the last beetle was found in cut flowers offered for inspection on October 3. Throughout the season, 247 adult beetles were removed from cut flowers examined at the Philadelphia wholesale houses. Toward the end of the seasonal quarantine, cut flowers were shipped out of the Baltimore market in unprecedented quantities, requiring the services of two inspectors to handle the shipments.

Grower decides to use only fumigated soil.--A geranium grower in the Philadelphia area who has had many of his potted plants killed by Japanese beetle grubs is now fumigating all of his potting soil. This grower states that one grub in a pot will eventually kill the plant.

Spruce-bough lots inspected.--The latter part of October three temporarily employed inspectors began surveying spruce-bough lots in northwestern Massachusetts and southwestern Vermont. No gypsy moth infestations have been found to date. Cutting of spruce boughs starts about October 15 and continues until the latter part of November. Boughs are put up in bales of 100 pounds each, and are shipped principally to New York City by truck or to St. Louis in carlots of 200 bales each.

New England nursery inspection under way.--On October 27 two five-man scout crews started the inspection of nurseries that are granted shipping permits under the gypsy moth quarantine regulations. Permits are granted only to nurseries free from gypsy moth infestation, both on the premises and in the immediate vicinity.

Autogiro scouting.--Autogiro scouting for Dutch elm diseased trees was completed in New York on September 30 and in New Jersey on October 2. In the entire 290 square miles scouted from the air in Orange County, N. Y., the aerial scouts located 84 individual and 3 groups of wilting elms. The ground crews working from the maps furnished by the airmen sampled and tagged 55 suspects. The autogiro returned to New Jersey at the conclusion of the Orange County work. Aerial scouting was continued in New Jersey until a second go-over in the protective area had been finished. Toward the end of the assignment, both autogiros flew in New Jersey. On the second go-over of slightly over 612 square miles in Hunterdon, Warren, and Sussex Counties, the aerial scouts located a total of 134 individual and 6 groups of wilting elms. At the conclusion of the systematic scouting for infected trees, both autogiro crews scouted for dead and dying elms on the east side of the Delaware River. In a continuous strip from 4 to 6 miles wide, the two crews covered an area of 102 square miles and located a total of 38 groups and 61 individual dead and dying elms. Most of these groups are quite large and contain many dead elm trees. On ground follow-up the ground crews tagged a total of 1,147 dead and dying elms. Some of the aerial photographic maps covered a small strip of Mercer County, and this also was scouted for dead elms by the ground crews. On October 23 the two autogiros completed their aerial survey for dead and dying trees, and switched to mapping elm-free sections in the New Jersey protective zone.

Another diseased tree between major and isolated infected areas in Connecticut.--Confirmation was recently received of an elm located at Guilford, New Haven County. This tree is approximately 8 miles east of the infected tree recently located at Branford. The 10-mile protective zone surrounding the Guilford tree almost overlaps with the protective areas surrounding the Old Lyme infection center and that adjoining the Fairfield County major infected zone. In effect, therefore, there is created a continuous protective zone from Fairfield County east through New Haven and Middlesex Counties to New London County.

Sanitation crews in field.--Most of the W. P. A. personnel was transferred to elm-sanitation work at the beginning of the monthly work period, which was delayed until October 8 in New York and Connecticut and until October 12 in New Jersey. By October 24 the men engaged in this activity numbered 2,537, of which total 145 were working in Connecticut, 1,756 in New Jersey, 533 in New York, and 103 in States outside the major infected zone. Four hundred and thirteen men were assigned to survey work to locate dead and dying elms, and 1,372 men were engaged in chemically treating with copper sulphate elms in woodland areas to be made elm-free.

Confirmations drop off.--The Dutch elm disease laboratory has completed the culturing of all samples submitted during the scouting season and further confirmations are at a minimum. During the month only 13 elms were reported as infected. The total number of confirmations to October 31 is 21,770.

FOREST INSECT INVESTIGATIONS

Fir bark louse.--H. J. MacAloney, of the New Haven, Conn., laboratory, reports as follows on *Adelges piceae* Ratz.:"On October 5 the area at Grantham, N. H., which was sprayed in April 1935, was examined. Although there appears to be a general decrease in the infestation in this area, a few trees in the check plot show heavier attack than in 1935. On the other hand, in the 4 treated plots sprayed, respectively, with lime-sulphur 1-9, lime-sulphur 1-20, Sunoco Oil 1-25, and Volck Oil 1-25, there is no attack on the 12 marked trees in each plot. None of the sprayed trees, which were heavily attacked at the time of treatment, have died--in fact some of them appear to be in a vigorous condition. One of the objects of this spraying project was to ascertain whether the fir bark louse was the causal agent in the death of the trees or whether the trees would die from some other reason if the insects were eliminated. It appears from this study that the bark louse is the chief cause of the death of the balsam fir in this area. The four spray solutions can also be considered effective against this insect, although it is the writer's opinion that they could be used only on ornamentals, because of the expense."

Eastern spruce beetle.--J. V. Schaffner, Jr., New Haven, reports that the latest information on the extent of the infestation of *Dendroctonus piceaperda* Hopk. in the Green Mountain National Forest in Rochester, Vt., indicates that from 800-900 acres are seriously injured. A light infestation occurs in the Battell Forest Park in Hancock, Vt. Data obtained from examination of samples of bark from dead and dying trees are summarized in the following table.

Area	Trees		Bark	*D. piceaperda*		Hymenopterous parasites	Dipterous larvae[1]
	Sampled	Alive	examined	Living	Dead		
	Number	Number	Sq. inches	Number	Number	Number	Number
Green Mountain National Forest	7	2	396	128	34	16	14
Battell Forest Park	3	2	638	63	44	21	4

[1] Possibly parasitic.

Both adults and larvae of the secondary beetles Dryocoetes affaber Mann., Polygraphus rufipennis Kby., and Trypodendron bivitattum Kby. were numerous in both areas, as were also larvae of Cerambycidae. Blue stain was found on one tree in Green Mountain National Forest but none in Battell Forest Park. Woodpeckers are abundant and are assisting in reducing the infestation on the national forest. A few instances were noted in Battell Park where beetles had been drowned in the flow of pitch, indicating that the trees were still in a fairly vigorous condition. It was noted that in some instances one side of the tree was attacked one year and the other side the following year. This was indicated on trees that had recently died by the presence of living beetles on one side of the tree, while on the other side the Dendroctonus were dead or had issued.

Forest tent caterpillar.--Mr. Schaffner reports that egg clusters of Malacosoma disstria Hbn., collected from sugar maples in nine towns in Vermont indicate that a considerable population of this insect still exists after 3 years' infestation. The rate of collection per hour in eight of the localities ranged from 37 to 86. At one locality only five egg clusters were collected in an hour.

Egg parasite of gypsy moth.--Mr. Schaffner also reports as follows on the abundance of Ooencyrtus kuvanae How., an imported egg parasite of the gypsy moth. "This egg parasite of the gypsy moth apparently has increased tremendously in certain localities in Massachusetts. Late in September it was very common on gypsy moth egg clusters in woodland in Dover, Mass., and on October 30 the adults were abundant in wooded areas at Hopkinton, Mass. Most egg clusters in this locality show many exit holes, indicating that the outer layer of eggs is well parasitized. These parasites are more abundant here than I have observed them at any time since 1917. The gypsy moth infestation in the localities mentioned is rather heavy at present."

Fluctuation of gypsy moth infestation.--W. L. Baker, New Haven, reports on an analysis of infestation data concerning the gypsy moth from a series of 172 plots running from 5 to 15 years. He says: "The purpose was to determine, if possible, the tendency of infestations to fluctuate. Taking these data and analyzing them year by year and plot by plot, it was found that out of a total of 2,322 changes in intensity of infestation, 1,143 showed gains and 1,179 losses, or 49.2 and 50.8 percent, respectively. By assembling the data in population groups it was possible to determine the percentage of infestations that registered losses the following year in passing from light to heavy infestations. These data represent the older infested region of eastern New England, and are as follows:

Egg clusters per acre any year	Infestations that increased	Infestations that decreased	
	Number	Number	Percent
Less than 100	627	401	39.0
100 - 500	362	297	45.1
500 - 1,000	107	178	62.5
1,000 - 2,000	32	196	85.9
2,000 - 3,000	10	45	81.8
3,000 - 4,000	3	29	90.6
4,000 - 5,000	1	14	93.3
Over 5,000	1	19	95.0

Low-temperature test on larvae of Black Hills beetle.--At the Fort Collins laboratory a new refrigeration unit has been installed for the purpose of determining fatal low temperatures for certain destructive forest insects. J. S. Yuill, of the Berkeley, Calif., laboratory, spent some time adjusting and checking this machine and putting it into proper running order. One test was run using 550 larvae of *Dendroctonus ponderosae* Hopk. taken from ponderosa pine at an elevation of 8,500 feet on the Roosevelt National Forest. As this is the first time such a test has ever been made on the Black Hills beetle, the preliminary results are of special interest. Eleven groups of 50 larvae each were placed in individual paraffin cells in petri dishes and exposed at the desired temperatures for 2 hours and 15 minutes. The final check 48 hours after removal from the cabinet gave the following results:

Temperature in °F.	*D. ponderosae*	
	Alive	Dead
	Percent	Percent
15.0	94	6
10.0	96	4
5.0	94	6
0.	98	2
-2.5	76	24
-5.0	70	30
-7.5	26	74
-7.5	22	78
-10.0	0	100
-10.0	0	100

The first significant brood mortality appeared at an exposure of -2.5° and this increased rapidly as the temperature decreased until at -10° no living larvae were found. This test applies only to last-stage larvae collected late in October from ponderosa pine at 8,500 feet elevation near Estes Park. Subsequent temperature tests will be made to determine such factors as seasonal differences, host differences, and differences caused by location and elevation.

Further notes on importance of 2-year cycle for Black Hills beetle at high elevations.--It has previously been demonstrated by J. M. Whiteside, of the Fort Collins laboratory, that at elevations of about 10,000 feet in southern Wyoming a period of 2 years is required for complete development of parts of some broods of the Black Hills beetle. He also found that the "second-year" beetles emerge considerably earlier than those of the main flight. The importance of this early attack is shown in data gathered on one 8-acre-strip sample plot which was cruised at intervals of 2 weeks during 1936. On July 17, before the main flight occurred, 106 trees contained new attack. On July 30, following the main flight, 166 additional trees were attacked. On August 14 only 42 additional trees were attacked and by August 28 an additional 9 trees showed attack. This gives a total of 323 new trees on the plot during 1936, of which 106 or approximately one-third were attacked by the "second-year" beetles. Reducing these data to an acre basis, we have slightly over 40 new trees per acre, of which approximately 13 are the result of early season attack. This habit of the Black Hills beetle at higher elevations has a very important bearing on control practices. In many areas it will be necessary for spotters to examine all 2-year-old attacks and mark many of them for treatment.

Bark-beetle outbreak follows fire.--J. M. Miller, of the Berkeley, Calif., laboratory, reports that the Harris Ranch burn in the Sierra National Forest occurred in August 1934. This was a severe crown fire covering some 8,000 acres and killing outright about 40 million board feet of timber. The number of living trees that survived the fire, however, was considerable, and these produced a heavy seed crop in 1935. Bark-beetle infestations, a usual aftermath of fires of this type, were expected, but these insects did not appear in force until the summer of 1936. By September of this year the western pine beetle had killed about 3,000 summer-brood trees. The attack was characterized by large groups of trees such as occur in the epidemic condition of an infestation. The outbreak was confined, however, entirely to the area of the burn, whereas the infestation in the surrounding forest was extremely light. The trees killed during the 1936 season show little evidence of fire injury. Most of them had a full crown of foliage and had also completed two fourth rings since the burn. The only evident injury was light scorching of the outer bark near the base, from a hot ground fire. The conditions in this burn differ somewhat from similar fire areas in the long interval between the fire and the subsequent development of bark-beetle infestation.

Western pine beetle infestation in central Sierras at low point.--In the central California pine region, according to Mr. Miller, infestations of the western pine beetle have been lighter than at any time during the past 5 years. This applies to the entire territory from the Eldorado to the Sequoia National Forest, where severe epidemic outbreaks occurred from 1931 to 1934. Following major control work in these areas during 1932 and 1933, maintenance was carried on until the present season. The 1936 infestation is so light, however, that no control work will be recommended for the coming winter and spring.

Fir tussock moth appears in California areas.--Mr. Miller also reports that defoliation of white fir by a tussock moth, probably Hemerocampa pseudotsugata McDun., was noticeable in some northern California areas and on the eastern slopes of the Sierras in 1936. This is the first time in 25 years that there has been any record of this insect becoming sufficiently abundant to cause noticeable injury, although there are some early reports of this or a similar insect defoliating white fir in the Sierras about 1906 to 1908.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

The gypsy moth project.--W. P. A. gypsy moth scouting in Vermont, Massachusetts, Connecticut, New York, New Jersey, and Pennsylvania is now operating under more favorable conditions. Except on mountain peaks in Vermont, which are covered with from 2 to 8 inches of snow, conditions are nearly ideal. By the end of the month deciduous trees throughout the area being worked had dropped all foliage, making more thorough examination of the upper branches of the trees possible. The weather was favorable for scouting generally; back roads remain dry and swamplands can be worked. Thinning work is progressing satisfactorily, except that slash still remains unburned in several areas. Much of it will be left until enough snow falls to permit burning without danger. It has always been a precautionary practice to burn only on rainy days or wet days after a rain, but accumulation of large piles of slash is in itself a fire hazard. In several sections slash piles have been burned, despite dry conditions. when it appeared rather dangerous for them to remain. The burning was done under careful supervision of a large group of men and a spray truck was detailed to the spot to pump water if the fires got out of control. During October, as in September, particular attention was given, while the weather remains favorable and before winter begins, to scouting in areas likely to be inaccessible after heavy snowfall and during spring thaws. Back-country roads become snowbound in winter and are impassable because of mud during the spring, rendering the adjacent forest inaccessible except by long and arduous cross-country hiking; steep mountain sides, when open and exposed, are extremely uncomfortable places to work on cold winter days; and swamplands and river bottoms in the spring are generally flooded, making passage impossible. By scouting such areas in the fall, before traveling becomes too difficult, they are checked over more efficiently and potentially dangerous infestations are cleaned without undue hardship. This month W. P. A. workers on the gypsy moth project have completed the removal of new sprout growth in woodlands thinned out during the previous fiscal year, in all sections of the territory where thinning work was done. Sprout removal is very essential, particularly where many birch or oak stumps are left alive to produce sprouts, which, if not cleaned out, would provide favored food for the gypsy moth caterpillars next season and thus largely defeat the control results expected from the thinning operations. At the end of October there were 2,624 W. P. A. workers engaged in gypsy moth work and since July 1 over 1,000,000 acres of woodland have been scouted in Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, and Pennsylvania. Over 2,750,000 trees in open country were examined, favored food plants were thinned out and the forest thus improved on nearly 5,000 acres, and over 500,000 egg clusters were destroyed. Over half the

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acreage scouted and over a million of the trees in open country examined were in Vermont. Except for about 500 acres in Connecticut, practically all thinning work performed was in Massachusetts and Pennsylvania in nearly equal amount, and most of the egg clusters destroyed were in the two latter States. Scouting speed is limited in the areas where more egg clusters are found and destroyed and more forest thinning and improvement is necessary to provide future natural control. Gypsy moth work performed during October by enrollees from the C. C. C. camps east of and adjacent to the barrier zone in New England was greatly curtailed in volume, as compared with previous months. September 30 marked the end of an enrollment period and the camps are being remanned very slowly. New enrollees must undergo a 2-week hardening period at concentration points before they are released to the camps for work and the number of men allotted to gypsy moth work decreased early in the month to 717, about half the usual quota. By the end of the month an average of 993 men were allotted, many of whom are inexperienced on gypsy moth work and must be carefully trained over a period of time before full efficiency can be expected. Since July 1 in New Hampshire, Vermont, Massachusetts, and Connecticut C. C. C. men have scouted over 290,000 acres of woodland, cleaned and thinned over 2,200 acres, examined over 340,000 isolated trees in open country, and destroyed nearly 1,500,000 egg clusters. In this period 18,628 yards (over 10 miles) of stone walls have been examined for egg clusters. Examination is effected by tearing down the walls, careful scrutiny is made of each stone, and the wall then rebuilt as well as, if not better than, when found. The female gypsy moth's characteristic habit of seeking hidden shelter for oviposition explains the necessity for stone-wall examination, particularly in the more heavily infested areas where stone walls offer ideal crevices for the moths and unless thoroughly examined would be dangerous sources of infestation or reinfestation of otherwise well-cleaned woodlands. This work is often conducted under difficulty since many walls are thickly overgrown with brush and vines and the stones are heavy and hard to handle.

Progress in brown-tail moth control.--There were 353 W. P. A. brown-tail moth project employees working in Maine, New Hampshire, and Vermont during October engaged in cutting out favored food plants and destroying brown-tail moth webs. Since the beginning of the fiscal year on July 1st, 23,525 trees were cut in Maine, 33,207 in New Hampshire, and 11,299 in Vermont. In the same period 45,288 webs were destroyed in Maine and 1,645 in New Hampshire. No webs have been found to date in Vermont.

PLANT DISEASE CONTROL

Barberry eradication.--During the past few weeks areas infested with barberry bushes have been found in Yellow Medicine County, Minn., and in Steele County, N. Dak. These bushes were so situated with respect to the important grain-growing areas of these States as to constitute a distinct and direct rust hazard. The infestations were located by crews of laborers employed in connection with the emergency eradication program as a direct result of assigning labor crews to make a farm-to-farm survey for barberry bushes in the more intensively cultivated grain-growing areas of the Great Plains region. More than 3,000 barberry bushes have been eradicated in Yellow Medicine County and the limits of the area have not been reached.

Chemical eradication in Colorado.--E. A. Lungren, in charge of barberry eradication in Colorado and Wyoming, reported that 2,000 pounds of atlacide were used during October for eradicating Berberis fendleri in southwestern Colorado. Salt in solution also was used for making extensive field-eradication tests. Effective results have been obtained using 6 to 8 pounds of atlacide in 5 gallons of water to 1 square rod of ground surface. Results obtained with 36 pounds of salt in from 12 to 14 gallons of water also are encouraging. Further observations must be made in the spring, however, to determine the effectiveness of the kill.

Ribes-eradication season terminated.--In the Northeastern States the 1936 Ribes-eradication season was terminated at the end of September, except in New York and Pennsylvania where a small amount of work was carried on under the W. P. A. program during October. Control activities in this region during the period May to September, inclusive, resulted in 1,688,685 acres being cleared of 53,647,283 wild and 61,776 cultivated Ribes bushes. This work required 521,347 man-days of labor, which was performed under the Regular Cooperative, E. C. W., W. P. A., A. R. A., N. Y. A., and S. C. S. programs. Over 67 percent of the total area examined during 1936 was under the W. P. A. program, and nearly 30 percent was a result of the E. C. W. activities. Mapping of white pine and control areas will be the major field project in this region during the fall and winter months. In the Western States severe weather conditions and the complete defoliation of Ribes bushes in the western white pine region necessitated the closing out of all Ribes-eradication work in October, with the exception of the slashing programs being conducted in connection with nursery-sanitation work. The camps are being dismantled as rapidly as possible and the equipment is being trucked into the Coeur d'Alene, Idaho, warehouse for cleaning and repairing. Eradication camps in the sugar pine region have also been shut down and dismantled, with the exception of three camps in California and one in Oregon. These will continue Ribes eradication until the weather becomes too adverse for outside employment.

Blister rust host plants found infected for first time in new counties.--The North Central region leads in the number of counties from which white pine or Ribes were reported as infected for the first time in 1936. The disease was found on white pine in 10 counties in Wisconsin--Buffalo, Eau Claire, Winnebago, Rusk, Door, Vilas, Price, Langlade, Outagamie, and Waushara; 3 counties in Michigan--Schoolcraft, Saginaw, and St. Clair; and 1 in Minnesota--Todd. Infection on Ribes was found in Winnebago and Sauk Counties, Wis.; Koochiching County, Minn.; and Knox County, Ohio. These findings materially extend the known range of infection on these host plants in the Lake States. The Northeastern, Southern, Appalachian, and western white pine regions report no newly infected counties thus far this year. In the sugar pine region, the rust was found for the first time in Del Norte and Siskiyou Counties in California. Several new important infection centers were found on sugar pine in Curry, Coos, and Jackson Counties, Oreg., but these counties had been reported with minor Ribes infections in previous seasons. Ribes infection was reported for the first time from Josephine County, Oreg.

COTTON INSECT INVESTIGATIONS

Pink bollworm infestation.--H. S. Cavitt, of the Presidio, Tex., laboratory, reports on the seasonal records of the pink bollworm infestation made for comparison with previous years and for determining the factors causing variation in field infestations in the Big Bend. Biweekly counts were made in 30 fields of the infestation in blooms during June and July, and boll infestation and the number of bolls per plant during August and September. Fifteen of these were the same fields in which bloom infestation records were made in 1934 and 1935. In the 15 identical fields the average bloom infestation was 0.106 percent in 1934, 0.696 percent in 1935, and 2.262 percent in 1936. Considerable variation was noted in the bloom infestation in different fields. The earlier fruiting fields showed much heavier bloom infestations than the later fields, owing to the attraction of moths to these fields. As in previous years, it was again noted that heavier early infestations were usually found in the fields with heavier types of soil, probably because of higher survival of hibernating larvae. Boll-infestation records were started in the 30 fields the first week in August. For 21 of these fields records for 1935 are available for comparison. During the first half of August the average infestation in these 21 identical fields was 14.0 percent in 1935 and 13.7 percent in 1936, or practically the same. By the latter half of September the boll infestation had increased to 72 percent in 1935 and 95 percent in 1936. At this date there was an estimated population of approximately 146,442 larvae per acre in 1935 and 222,452 in 1936, despite the fact that there were fewer bolls per plant in 1936. The average estimated number of worms in all the 30 fields counted in 1936 increased from 12,000 per acre during the first half of August to 212,000 per acre during the latter half of September.

Pink bollworm parasites.--The work on pink bollworm parasite rearing and liberation was continued this season by L. W. Noble and W. T. Hunt at Presidio, Tex., and by C. S. Rude at Tlahualilo, Durango, Mexico. Considerable difficulty was experienced at Presidio in rearing sufficient host eggs of the Mediterranean flour moth for breeding Chelonus blackburni Cam. At the beginning of the summer the eggs failed to hatch because of the high temperatures or low humidity and practically all of one generation and most of another were lost. Moving the breeding stock into the air-conditioned parasite room increased the hatch somewhat but it still remained below the percentage that hatched in the spring with fluctuating temperatures. An infestation of mites developed in the parasite room from the Mediterranean flour moth material, necessitating thorough cleaning and fumigation, and caused the loss of considerable numbers of both hosts and parasites. A rearing room for the host material was arranged in a separate adobe building by installing a home-made cooling system such as is commonly used in the west. A funnel was fitted to the window through which the air is drawn into the room by a 16-inch fan placed in the small end. The large end was covered with 4 inches of excelsior held in place by chicken wire and kept moist by a spray of water. This equipment held the temperature to about 80° F. when the outside temperatures exceeded 100°. By operating the fan only in the daytime, conditions were favorable for breeding. Despite these difficulties, about 60,000 adults of Chelonus blackburni Cam. were liberated in several colonies near Presidio, and 14,000 were shipped to Puerto

Rico. Recoveries in the field have been made in Puerto Rico. In addition, stock was furnished to the Mexican parasite laboratory at Torreon from which 20,000 were reared and liberated in Mexico in cooperation with Mr. Rude. Field recoveries in considerable numbers have been made as far as 500 meters from the point of release in Mexico. The stock of Microbracon kirkpatricki Wilk. was reduced to very small numbers by the mite infestation. The supply was built up to about the maximum rate of production during the latter part of September and one colony of 2,000 adults was released and others will be released in October. Microbracon platynotae (Cush.), one of the most important native species of Texas and Mexico, was studied by Mr. Rude. In some cases as high as 50 percent of the pink bollworms in cotton flowers were parasitized and they were also reared from larvae inside bolls. This species was also reared from the larvae of Isophrictis sp., a native lepidopteron quite common in Mexico in the heads of blue weed (Helianthus ciliaris). It can be readily reared in the laboratory by the technique used for M. kirkpatricki. It was observed at Presidio last fall that some of the larvae of the Hawaiian strain of Microbracon mellitor Say went into a resting stage at temperatures favorable for development. In December 1935, 1,418 of these larvae were placed in a refrigerated room at 38° to 40° F. and 76.5 percent emerged upon removal about 7 months later. This species breeds slowly and only one parasite develops per host larva. One colony of 1,200 was released in September but, because of the late start owing to the mite infestation, additional rearings will be placed in cold storage for next year. Some 4,000 Exeristes roborator Fab. were liberated in Mexico by Rude in June in the same field in which 7,000 adults were liberated by the Torreon parasite laboratory. Recoveries were made in July but later collections have failed to recover any of the species. Approximately 25,000 of this species have been released in Mexico, and 8,000 in the Presidio Valley over a period of 3 years but apparently it has not become established. One colony of 1,445 were sent to Puerto Rico in May and 3,000 were liberated at Presidio in September of this year. The earlier colonies were of the European corn borer strain but the later liberations have all been of the Egyptian pink bollworm strain. Perisierola cellularis var. punctaticeps Kief., another native parasite which is quite common on pecan-infesting Lepidoptera in Texas, was found by Rude attacking pink bollworms in flowers and worms emerging from bolls in Mexico. It is easily reared in the laboratory and requires from 10 to 13 days for a generation, at temperatures ranging from 85° to 95° F. As many as 15 parasites may develop on a single pink bollworm.

Cotton leafhoppers.--C. F. Rainwater, of the Florence, S. C., laboratory, reports: "Cage tests were conducted during the first quarter of the year, using Graphocephala versuta (Say), Alconeura unipuncta, and Empoasca fabae Harris to determine (1) whether these will breed on cotton, and (2) the kind of injury they cause. These tests were replicated three times for each species, using approximately 25 specimens of each species on a single plant in each cage. The plants were freed of any insects before being caged. Two of the three Graphocephala cages had nymphs in them 9 days after the adults were caged. All three of the Alconeura cages had nymphs in them 11 days after the adults were caged. None of the Empoasca cages had nymphs in them. This was rather surprising because throughout the season *Empoasca* was present, and often in large numbers, as can be seen from the sweeping records. It did not appear likely that these numbers would have kept constantly migrating to cotton, but apparently that is what happened. The injury caused by each species is almost identical and, so far as observed, is confined to the leaves. Tiny, irregular, greenish-white feeding punctures on the upper surface of the leaves were observed in all cages. This same type of injury to the leaves was observed in every field examined during the season." Their seasonal abundance was determined by making one hundred sweeps once a week in each of ten cotton fields at Florence and Clemson College during July, August, and part of September. The average numbers taken per thousand sweeps were as follows:

Species	Florence			Clemson College		
	July	Aug.	Sept.	July	Aug.	Sept.
	Number	Number	Number	Number	Number	Number
Graphocephala versuta---	148	64	76	124	43	168
Alconeura unipuncta------	45	36	126	66	114	138
Empoasca fabae-----------	117	66	57	439	258	40

The Clemson sweepings were made by members of the experiment station entomological department.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Gin-trash inspection.—Intensive gin-trash inspection was continued during the first part of October in the regulated area of Florida, also in that part of Florida not regulated, and in southern Georgia and southeastern Alabama. About the middle of the month ginning had largely been completed and, as results had been negative for the last two crop seasons, the Florida area was released effective October 14. Intensive inspections were also continued in the Western Extension of Texas. In Andrews County two specimens of the pink bollworm were found, one in Dawson County, the first since the 1927 crop, and two in Terry County. Gin-trash inspection has been carried on in several regulated areas for the purpose of reestablishing infestation in the 1936 crop. In the Pecos Valley of Texas specimens were found at all of the gins and also in the Safford Valley of Arizona. In the Pecos Valley of New Mexico specimens were found at several gins in the southern part, but no specimens have been found in the northern part. Infestation was reestablished in the Mesilla Valley last month and during October several additional specimens had been found. In the lower Rio Grande Valley of Texas several bales of cotton were ginned throughout the month. All trash was inspected and five additional specimens of the pink bollworm were found. These all came from a gin where specimens had previously been found. Inspections in the Delta section of Mississippi were completed and also in the Delta section of Arkansas. While the machine was being operated in Arkansas samples of trash from two gins in Missouri were inspected, the first gin-trash inspection ever done in Missouri. Inspections in the San Joaquin Valley of California were completed and some work was done in the Coachella Valley. All results were negative except for the specimens mentioned above.

Wild cotton eradication.--The eradication of wild cotton in southern Florida with small W. P. A. crews was continued throughout the month. All of the known wild cotton area which could be reached by truck had been recleaned in two counties on the west coast, and good progress was made in the other counties involved. There are many keys along the coast line which have to be worked by boat, and two crews were engaged in this activity. At the close of October the recleaning was in the best shape it has ever been at this time of year. Some 4,000 acres were recleaned, from which 270 mature, 93,845 seedling, and 1,226 sprout plants were removed. In addition over 9,000 acres were scouted without finding any plants. The areas scouted are those sections lying closely adjacent to places where wild cotton has been found.

Thurberia plant eradication.--Satisfactory progress has been made with the eradication of Thurberia plants in the Santa Catalina Mountains of southern Arizona. This work is being carried on with W. P. A. funds, with crews working out from Tucson. Most of the area that can be easily reached from Tucson has been covered. About the middle of the month a camp was established in the mountains. Permission was given for the Boy Scout camp site to be used, making it possible to establish the camp with little trouble. The crews at Camp Lawton have covered considerable acreage without finding any Thurberia plants. They have been working at altitudes of from 6,000 to 8,000 feet. Within the near future it will be determined whether or not Thurberia plants will grow in such altitudes, and if not, considerable territory can be eliminated. During October 16,740 acres were covered and 15,135 Thurberia plants were destroyed.

Road-station inspection.--During October 976 cars were inspected at the Marfa, Tex., road station, and only 10 of them were found to be carrying contraband material. Some of this material was infested with the pink bollworm. From 75 locks of seed cotton intercepted on October 3, 6 living larvae, 9 dead larvae, and 3 pupae were taken. On October 8, 50 locks of seed cotton were taken from 2 pick sacks, and in this material 5 living larvae were found. On October 24, 47 locks of seed cotton were found to contain 7 living and 5 dead larvae, and on October 26, 29 locks of seed cotton taken from 2 pick sacks contained a living larva. The road on which the station is located runs along the side of Fort D. A. Russell. During the month it was necessary to change the road so as to conform to Army regulations covering the powder magazine. The Commanding Officer inquired whether or not this change would interfere with the operation of the station and, upon being informed that it would not, he sent Army trucks and men to move the station to the new location.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Flight ability of sweetpotato weevil.--As a result of field experiments in 1936, K. L. Cockerham, of the Biloxi, Miss., laboratory, has determined that Cylas formicarius Fab. is able to fly at least 400 yards. In the course of these experiments two small patches of sweetpotatoes were planted at distances of 200 and 400 yards, respectively, from the nearest source of infestation, which comprised a storage bed containing potatoes infested by the sweetpotato weevil. Examinations in October of the sweetpotatoes growing in the two experimental plantings revealed the presence of the weevil at both points. This information will have an important bearing on recommendations for the avoidance of sweetpotato weevil infestation, since it gives pertinent information respecting the necessity of planting new fields of sweetpotatoes at a distance from fields known to be infested.

Sterilizing food of wireworms retards development and pupation.--Recent laboratory tests performed by M. W. Stone, of the Alhambra, Calif., laboratory, have indicated that the rate of development of the larvae of Melanotus longulus Lec. is retarded by feeding on lima beans made sterile by boiling. It has been the custom when feeding wireworms confined in ointment-can cages to boil the larger seed such as lima beans and corn in order to prevent germination of such seed. Failure to follow this procedure has resulted usually in the lids of the cages being pushed off by the germinating seed with subsequent loss of or desiccation of the larvae shortly after the lids are pushed off. Of a group of 25 M. longulus larvae of the 1933 brood, each of which was fed one sterile lima bean monthly from date of hatching, no pupations occurred during the period 1934-1936. On the other hand, in a group of 75 larvae of the 1933 brood, which were equally divided into 3 groups and fed various quantities of water-soaked wheat (not sterilized), 32 percent matured in 1934, 29.3 percent in 1935, and 8 percent in 1936. The maturing individuals represented 2-, 3-, and 4-year cycles, respectively. Four larvae of the original group will not mature until 1937, and 19 of the larvae succumbed during the course of the experiment. Beginning on May 1, 1936, the 17 remaining larvae of the original group of 25 that were being fed on sterile lima beans were separated in two groups. Group 1, consisting of eight larvae, were continued on the diet of one sterilized lima bean monthly. The diet of each of the nine larvae comprising group 2 was changed to one uncooked lima bean monthly. No pupations occurred during 1936 in Group 1, which were continued on sterile beans, but in Group 2 three of the larvae pupated. The larvae fed on unsterilized lima beans made greater gains in weight. Late in October the larvae in the sterile group weighed 37 mg on an average, while those fed on the unsterilized lima beans averaged 81 mg, indicating that in a period of 1 month the larvae fed on unsterilized lima beans more than doubled their weight, as compared to the slower developing larvae fed on sterile lima beans.

Comparative efficiency of different poisons and bait constituents against larvae of the southern armyworm.--Laboratory tests conducted by C. B. Wisecup, of the Sanford, Fla., laboratory, with half-grown larvae of Prodenia eridania Cram., using different poisons and different bait constituents, have indicated that paris green and synthetic cryolite were much superior as poisons to either phenothiazine or cube when used at ordinary dosages. There was no difference in mortality of the larvae when corn meal was substituted for cottonseed meal. The addition of syrup significantly increased the mortality, and the addition of lemons did not increase the mortality but had a slight tendency to decrease the efficiency of the bait. In general, these laboratory tests indicated that poisoned-bait mixtures consisting of bran, cottonseed meal, or corn meal, paris green, cryolite, phenothiazine, or cube, with syrup and ground lemons, were not sufficient to overcome the attractiveness of the natural green food of the southern armyworm larvae. Based on the evidence obtained during these laboratory tests, it appears that poisoned baits did not give satisfactory control of the southern armyworm under field conditions where the natural food was growing in abundance, unless excessive dosages of poison were used (approximately 7 pounds of the poison to each 100 pounds of bait) and unless the bait was placed in close proximity to the larvae.

Relative efficiency of various sprays against Mexican bean beetle in irrigated fields.--R. L. Wallis, of the Grand Junction, Colo., laboratory, reports that the results of field-control experiments performed against Epilachna varivestis Muls. during 1936 on beans grown under irrigation revealed that a derris spray suspension containing 0.015 percent rotenone is as effective against the Mexican bean beetle as a derris spray containing 0.02 percent rotenone. Sprays containing 3 pounds of cryolite to 50 gallons of water, or derris containing 0.015 percent rotenone, or cube sprays containing 0.02 percent rotenone, were more efficient that a spray containing 1 pound of zinc arsenite to 50 gallons of water. The latter spray is most commonly used by growers of beans in the Grand Junction, Colo., district. The addition of nicotine sulphate (containing 40 percent nicotine), or a diphenyl butyl sodium sulphonate wetter and spreader, to cryolite did not improve its efficiency against the bean beetle. Calcium arsenate with hydrated lime (1-6-50) gave comparatively poor results and barium fluosilicate was ineffective.

INSECTS AFFECTING MAN AND ANIMALS

Subsurface-feeding mosquito larvae destroyed with paris green.--W. V. King and T. E. McNeel, of the Orlando, Fla., laboratory, report that field tests carried out in Pinellas County, Fla., on the destruction of the larvae of Aedes taeniorhynchus Wied. and Psorophora columbiae D. and K. with paris green, in which the arsenical was mixed with water and applied with sprinkling cans, gave a high percentage of kill in varying depths of water and in the heaviest plant growths. The quantities of poison used ranged from 1 to 5 pounds per acre.

Effect of low temperatures on Hunterellus hookeri How., parasitizing American dog tick.--C. N. Smith and Helen L. Trembley, Washington, D. C., report that seven nymphs of Dermacentor variabilis Say from which the parasites were about to emerge were placed in a refrigerator at about 40° F. and were held there for periods ranging from 3 to 7 days. No parasites emerged after the nymphs were returned to a warm room. Many adults were exposed in glass vials in the same refrigerator. After 3 days' exposure 50 percent recovered, whereas after 4 and 5 days' exposure 20 percent recovered. Four females exposed for 5 days were tested for fertility by placing them in an engorging cell on a guinea pig. This cell contained nymphs which had been attached for 2 days. Of the 36 engorged nymphs that dropped, 19 were parasitized.

Soil treatment for destruction of pupae of primary screwworm fly.--E. F. Knipling and A. L. Brody, Valdosta, Ga., have determined that sodium cyanide in small dilutions gives 100-percent control of pupae of Cochliomyia americana Cushing and Patton in the soil at a cost of slightly more than 1 cent per square yard. Carbon disulphide was effective in even weaker dilutions, but the cost of carbon disulphide and the emulsifier was nearly three times that of cyanide. Pyridine, furfural, and ortho-dichlorobenzene were also 100-percent effective against pupae in the soil, but the cost of the dilutions used was considerably higher than that of sodium cyanide or carbon disulphide.

Viability of all stages of C. americana in screened cages.--Mr. Brody, working on the biology of the primary screwworm fly under artificial conditions, found: (1) The shortest preoviposition period recorded from observation of C. americana adults in outdoor cages during October was 6 days. (2) The shortest larval life of C. americana in the animal during October was about 6 days. (3) The shortest pupal period of C. americana during October was 13 days.

Depth of pupation and lateral migration of C. americana.--H. E. Parish and J. T. Bigham, Menard, Tex., report results of studies on the depth of pupation and lateral migration of C. americana larvae in soil as follows: (1) The weighted mean depth of pupation was 0.171 inch in the black-loam pecan-bottom land and 0.35 inch in the rocky, gravelly soil. (2) The weighted mean lateral migration was 12.46 inches for the black-loam pecan-bottom and 7.1 inches on the rocky, gravelly soil.

FOREIGN PARASITE INTRODUCTION

European station moved to Paris.--On October 1 the field laboratory at Hyeres, France, originally set up for conducting the parasite work on the European corn borer in France and Italy, was closed and the new laboratory established at 61 Avenue Belmontet, St. Cloud, S. & O. This location is in the suburbs of Paris and provides an excellent headquarters for the work, which extends throughout Europe and the Mediterranean region.

Hawaiian parasite project completed.--The foreign phases of the Hawaiian fruit fly control project have been completed and the four expeditions have returned. During the course of this work a total of 22 species of fruit fly parasites, totaling 2,593 individuals, reached Hawaii alive from West Africa, Brazil, Malaya, India, Puerto Rico, and Mexico. The species of Opius from Brazil, Puerto Rico, and Mexico, which are parasitic upon Anastrepha spp., did not prove adaptable to Ceratitis.

FOREIGN PLANT QUARANTINES

Entomological interceptions of interest.--Four living puparia of the Mediterranean fruit fly (Ceratitis capitata Wied.) were taken at New York on September 29 on paper wrapping around six decayed apples in baggage from Malta. This represents the first record in our files of this fruit fly being intercepted from Malta. Fourteen puparia of the melon fly (Bactrocera cucurbitae Coq.) were intercepted at San Francisco on August 24 in sphagnum moss packing around young palm trees in express cargo from Hawaii. One pupal case contained a dead adult fly, from which it was possible to make a specific determination. Living specimens of the scale insect Phenacaspis eugeniae (Mask.) arrived at Honolulu, Hawaii, on June 8 on Meryta sinclairii in cargo from New Zealand. Living adults of the hairy-vetch bruchid (*Bruchus brachialis* Fahr.) were taken at Norfolk, Va., on September 3 in and on hairy-vetch seed in cargo from Hungary. The gladiolus thrips (*Taeniothrips simplex* Morison) was intercepted at Philadelphia on July 30 on gladiolus blossoms in passenger's quarters from Puerto Rico. An adult of *Sitona inops* Gyll. arrived at Baltimore, Md., on October 7 with white millet seed in the mail from Hungary. This weevil is recorded as attacking the roots and root nodules of lucerne or alfalfa in Ukraine, Union of Soviet Socialist Republics. Four living adults of the West Indian sweetpotato weevil (*Euscepes batatae* Waterh.) arrived at Mobile, Ala., on September 14 in sweetpotatoes in stores from Brazil. Living specimens of the mealybug *Pseudococcus diminutus* Leon. were intercepted at Honolulu, Hawaii, on June 8 on *Phormium cookiana* in cargo from New Zealand. A living specimen of the tingitid *Orthaea servillei* Guer. was taken at Brownsville, Tex., on June 4 on a snapdragon in baggage from Mexico. A living adult of the weevil *Metamasius submaculatus* Champ. arrived at Seattle, Wash., on July 23 on a banana fruit in cargo from Costa Rica. A living specimen of the pentatomid *Meadorus griseus* L. was intercepted at Washington, D. C., on April 24 on clematis in the mail from England. Three living larvae of the avocado seed moth (*Stenoma catenifer* Wlsm.) were intercepted at Laredo, Tex., on September 1 in an avocado seed in baggage from Mexico. A living larva of this moth was also taken at New Orleans on September 7 in the same host in baggage from British Honduras. This species feeds in the fruit and seed of avocado and appears to be of considerable economic importance by its destructiveness.

Pink bollworm intercepted in Hawaiian mail.--Four cotton bolls infested with living larvae of the pink bollworm (*Pectinophora gossypiella* Saund.) were intercepted in Hawaii in parcel-post packages destined for the mainland.

Citrus blackfly (Aleurocanthus woglumi Ashm.) found in shipment of sour limes from Bahamas.--A shipment of 8 crates of sour limes from Nassau arrived at Miami, Fla. on September 30, 1936. Inspection of 3½ crates of this shipment revealed the presence of 22 lime leaves mixed with the fruit. Seven of these leaves were found to be infested with the citrus blackfly. The shipment was refused entry and was immediately transferred to another ship at the same dock for return to Nassau. This represents the third interception of citrus blackfly on lime leaves at Miami during the month of September.

Camouflaged contraband.--boxwood among tawdry paper flowers.--A woman stepped off the gangplank at New York holding a bouquet of paper flowers, easily identified, on October 5. A dark green, natural-looking twig in the center was detected by the plant-quarantine inspector. Investigation and seizure of a cutting of boxwood, almost out of sight, followed. The *Buxus* sp.? carried live scales from Montserrat, British West Indies.

Smuggling bulbs--Custom's guard finds coat sleeves are nests for roots.--The guard at the gate of a New York pier on October 5 called the United States Deputy Surveyor because he found two packages which were hidden in a woman's coat sleeve, apparently in an attempt to smuggle them.

They contained 6 scilla bulbs and 10 lily-of-the-valley pips from Sweden, in soil. These were later turned over to the plant-quarantine inspector, and a now thoroughly frightened passenger, destined for California, promised never to attempt smuggling again. An unidentifiable damaged cast skin of a lepidopterous larva was intercepted in the soil about the lily-of-the-valley roots.

Pathological interceptions of interest.--A diseased yam from Grenada, B. W. I., intercepted at New York October 5, was found to contain a few specimens of *Cephalobus* sp., probably new, in addition to numerous *Pratylenchus* (*Anguillulina*) *pratensis* (de Man) Filipjev. A diseased carrot from England intercepted at New York on October 20 was infected with what appeared to be *Ceratostomella fimbriata* (E. & H.) Ell., although no report of this black-rot of sweetpotato occurring on carrot was found. Our first interception of *Cercospora bloxami* Berk. & Br. was made at New York on October 6 on white turnip leaves from Colombia. *Cercospora* sp., no species found listed on the host in the manuals, was intercepted on *Tradescantia* sp. from Mexico October 22 at Eagle Pass. A second interception (see N. L. for July 1935, p. 20) of *Chrysomyxa piperiana* (Arth.) Sacc. & Trott. was made at Blaine, Wash., on October 11 on wild rhododendron leaves from Hope, British Columbia. So little is known regarding the rust that specialists are not even sure it belongs in the genus *Chrysomyxa*. Inspectors in Washington State have been asked to be on the lookout for suitable material for study. Our first interception of *Fusicladium depressum* var. *petroselini* was made at New York October 3 on parsley from Poland. Our first interception of *F. eriobotryae* Cav. from the Philippines was made at Seattle on September 16 on fruit of *Eriobotrya* sp. Other interceptions from New York included *Glomerella cingulata* (Ston.) Spauld. and Schrenk on apple, first interception from Lithuania; *Pestalozzia palmarum* Cke., first interception on coconut and first from Puerto Rico, on October 6; *Phoma* sp., first interception on pear and first from Czechoslovakia on October 8; *Phomopsis vexans* (Sacc. & Syd.) Harter on eggplant, first interception from Greece on October 20; *Puccinia chrysanthemi* Roze on chrysanthemums, first interception from Scotland and *P. absinthii* (Hedw. f.) D. C., first interception, on terragon from England, on October 25.

New nema in iris bulbs named.--A new plant parasitic nematode found in iris bulbs from Holland at the Inspection House has been named *Aphelenchoides limberi* Steiner. "It is named in recognition of the service which D. P. Limber of the Federal Inspection House, Washington, D. C., has rendered nematology in his work." (See Proc. Helminthological Soc., Wash., vol. 3, no. 2, pp. 74-76, July 1936.)

Bulb nema and others renamed.--*Anguillulina* (*Tylenchus*) *dipsaci* (Kuhn) Gerv. and v. Ben. has been renamed *Ditylenchus dipsaci* (Kuhn) Filipjev, according to an article in the Proceedings mentioned in the preceding paragraph (see pp. 80-82). While it had been known for some time that a revision of the classification of the Tylenchinae was needed, it had not been done until the Russian specialist I. N. Filipjev published such a revision. In addition to the bulb nema, two others occurring rather frequently in intercepted material are renamed. *Anguillulina pratensis* (de Man) Goffart becomes *Pratylenchus pratensis* (de Man) Filipjev, and *A. tritici* (Steinbuch) Gerv. and v. Ben. becomes *Ditylenchus tritici* (Steinbuch) Filipjev.

DOMESTIC PLANT QUARANTINES

Narcissus-bulb quarantine under consideration.--A public hearing will be held at the National Museum, Washington, D. C., at 10 a. m., December 16, to consider the advisability of establishing a domestic plant quarantine requiring the treatment of narcissus bulbs and other hosts of the bulb nematode before shipment in interstate commerce.

Dutch elm disease quarantine amended.--Because of the discovery of infected elm trees in new areas during the year, the area regulated under Federal quarantine 71 was extended, effective November 9, to include new districts in Orange and Suffolk Counties, N. Y., two towns in Fairfield County, Conn., and numerous townships and boroughs in New Jersey, all contiguous to the area formerly under regulation.

Satin moth quarantine revoked.--The satin moth quarantine, which affected parts of all the New England States and of Washington State, was revoked effective November 2, owing to lack of Federal facilities for the enforcement of quarantine regulations in Oregon and Washington. The insect became established in Oregon only recently. The native and introduced insect parasites have so reduced the intensity of infestation that it is doubtful, the press notice states, whether the satin moth will ever become a serious pest in this country.

Rhode Island modifies regulations relating to white pine blister rust.--Restrictions on the planting of the yellow flowering currant in Rhode Island were removed on October 1, for the reason, the announcement states, that plant pathologists no longer class Ribes aureum and R. odoratum with the black currant in degree of susceptibility to the white pine blister rust. The modification in no way affects the prohibition relating to the planting of R. nigrum in the State.

Citrus canker inspection in Texas.--A house-to-house inspection of all properties in 27 counties in Texas and of all abandoned citrus groves in 3 additional counties was accomplished in the year ending August 31, 1936, according to a recent report from the field leader. The work included the inspection of over 2,000,000 nursery trees. Canker was found on home properties in four counties in the Galveston area, of which three were formerly known to be infected. Relief crews in Texas have destroyed approximately 6,000,000 worthless citrus trees in this period. The inspection force on September 1 was comprised of 11 Federal and 6 State employees. The peak of relief labor was reached on October 25, when 375 men were employed.

Citrus canker inspection in Alabama and Mississippi.--Citrus canker inspection now being conducted in three counties each in southern Alabama and Mississippi cooperatively with these States has thus far disclosed no canker. Citrus trifoliata trees which have lived over since the satsuma-growing industry was attempted years ago still persist in many places and are now being eradicated, over 300,000 such trees having been removed from Mississippi, and over 200,000 from Alabama in the 5-week period since the work began on September 18. One hundred relief laborers are employed in

Mississippi and 60 in Alabama. Inspectors working Honey Island Swamp in Pearl River on the Mississippi-Louisiana border report that the C. trifoliata trees existing there are the outgrowth of plantings once made in connection with an attempt to establish a bee industry on the island. Colonies of wild bees once existed on Honey Island and a physician having visions of developing a commercial bee industry planted numbers of these trees for their nectar. The island is now inhabited principally by muskrat trappers.

Transit-inspection activities.--The transit-inspection force in October was increased to 33 men working at 15 different stations throughout the country, inspecting fall nursery-stock shipments and other articles to determine compliance with domestic plant quarantine regulations. Six of the inspectors were State men and 11 were assigned from other projects of the Bureau to assist in the work. At Jacksonville, St. Paul, and St. Louis, cooperative inspection is conducted for compliance with both foreign and domestic quarantines.

Peach mosaic allotment increased.--An additional $40,000 has been made available from emergency funds for control of the peach mosaic disease. This will be used in the infected States of Arizona, California, Colorado, New Mexico, Texas, and Utah.

CONTROL INVESTIGATIONS

New laboratory device aids in aphid control.--In experiments by H. H. Richardson, at the Beltsville, Md., laboratory, on the fumigating action of nicotine, a laboratory apparatus has been devised to produce concentrations of nicotine as low as one part, or less, of nicotine per four million parts of air. The apparatus is of Pyrex glass with ground-glass connections in that part through which the nicotine gas passes. Rubber connections cannot be used because of the great affinity of rubber for nicotine, as found by Harlan and Hixon. Air flows are obtained by using compressed air, the flow being measured through calibrated flowmeters. The nicotine gas is obtained by bubbling air through pure free nicotine. Aphids have been found very susceptible to nicotine, one part nicotine per million parts of air being sufficient with a 30-minute exposure (77° F.) to give fairly high kills. Preliminary tests have also indicated that nicotine is much more effective at low relative humidities (0 percent) than at high relative humidities (75 percent). Three species of aphids are being used.

Innervation of insect hearts.--At the Beltsville laboratory N. E. McIndoo has recently studied the innervation of the dorsal blood vessels of the roach, the silkworm, and the southern armyworm. The information gained is expected to help explain the effects of nicotine on the insect heart. The dorsal blood vessel of the roach is well innervated; that of the silkworm is fairly well supplied with nerves; but this vessel in the armyworm is poorly innervated. The blood vessels of the roach and silkworm are each provided with two lateral cardiac nerves that run the full length of the vessel, but so far no cardiac nerves have been found in the armyworm.

INSECTICIDE INVESTIGATIONS

Survey of calcium arsenates completed.--The survey of the commercial calcium arsenate now on the American market, the beginning of which was noted in the News Letter for March 1936 (page 23), has now been completed. It embraced the examination of 22 samples, most of them the normal products of the manufacturing firms but a few of them special products deledoped in an effort to overcome the phytocidal action of ordinary calcium arsenate. The chemical work of O. A. Nelson has confirmed previous findings by this Division that the various brands differ materially among themselves. His work shows again that commercial calcium arsenate is essentially a mixture of small quantities of calcium carbonate and calcium hydroxide with a true calcium arsenate whose make-up itself varies in a certain respect, namely, in the proportion of calcium oxide to arsenic oxide that it contains. We have again found that this proportion is always between 3:1 and 4:1. L. D. Goodhue has made a physical examination of these same samples by means of the apparatus mentioned in the News Letter for April 1936 (page 21), and finds that they differ greatly in their degree of fineness. The coarser sample contained only 34 percent by weight of particles having diameters less than 0.01 mm, whereas the finest sample contained 93 percent of particles of that size. There appears to be a correlation between particle size and the ratio $CaO:As_2O_5$ mentioned above, the larger ratio corresponding in general with the smaller size. There also appears to be a correlation between particle size and solubility as determined by the New York method, the coarser material giving the higher figure for soluble arsenic. All these characteristics are interlocked, and commercial calcium arsenate as normally prepared is not an equilibrium product, the differences observed being the result of differences in the degree to which equilibrium has been approached. As mentioned in the News Letter previously, all of the special products were less soluble than the corresponding regular products of the firms producing them and it can now be said also that in every case the special product was more finely divided than the regular one. Both phases of this investigation were presented at the meeting of the Eastern Branch of the American Association of Economic Entomologists in New York City on November 12-13 and will be published as soon as possible.

BEE CULTURE

Supersedure of queens.--C. L. Farrar, Laramie, Wyo., and Warren Whitcomb, Jr., Baton Rouge, La., reporting results of the season's work on the problem of supersedure, state that both the conditions under which queens are reared and the conditions surrounding the colonies into which they are introduced play a part in this phenomenon.

Marking queens.--Considerable difficulty is experienced at times in making fine enough identification dots of paint on honeybees when marking with more than one dot per bee is attempted. During the past summer W. J. Nolan, Beltsville, Md., has overcome this difficulty by the use of an injecting needle with the slanting metal point ground off. Commercial label varnish has been found a satisfactory medium for the pigments used.

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IDENTIFICATION AND CLASSIFICATION OF INSECTS

Second record of a cactus weevil.--One specimen of a remarkable curculionid weevil, determined by L. L. Buchanan as Gerstaeckeria mutillaria Gerst., was intercepted on cactus from Mexico at the Yokohama, Japan, station of the Imperial Quarantine Service, and submitted for identification. This appears to be the second reported specimen of the species. The holotype is in the Berlin Museum.

Unusual record for the southern green stinkbug.--Two specimens of this injurious bug were collected on field tobacco at Windsor, Conn., in July 1936, by A. W. Morrill, Jr. The specimens were identified as Nezara viridula Linn. by H. G. Barber, who reports that this is the first record of the appearance of this species so far north of its usual range.

Interception of an injurious fulgorid.--An egg mass of a fulgorid, identified by P. W. Oman as apparently Siphanta acuta Walk., was intercepted at San Francisco (No. 9160) on Hoheria dentata from New Zealand. S. acuta, one of the Flatinae, is a native of Australia, but has been introduced into New Zealand and the Hawaiian Islands. Tillyard reports it to be abundant on the leaves of eucalyptus in Australia and New Zealand, and refers to it as the green eucalyptus hopper. In Hawaii it is known as the torpedo bug, and is reported by Swezey and Kirkaldy as at one time very abundant and a general feeder, but found especially on coffee, mango, sumac, and Acacia koa. At present S. acuta is reported to be kept under control in Hawaii by a hymenopterous egg parasite, Aphanomerus pusillus Perk.

New record of an aleyrodid from rhododendron.--Specimens of white fly taken on rhododendron at Westbury, N. Y., and submitted for determination by C. A. Weigel, of the Division of Truck Crop and Garden Insect Investigations, were determined by P. W. Mason as Trialeurodes sp. Mr. Mason reports that no species of this genus has previously been recorded from rhododendron.

An unusual coccid interception.--An adult female of the comparatively rare coccid Steingelia gorodetskia Nassanow has been identified recently by Harold Morrison, the specimen having been recorded as collected at Honolulu in packing material around Aster cordifolius shipped from England (Honolulu 9229). From the few records, the insect presumably occurs in Europe from England to Russia, but its intermediate stages and life history are unknown.

New record for coccid infesting rubber plant.--Specimens of a scale insect found on Hevea from Trinidad at the District of Columbia inspection house on June 20, 1936, collected by D. P. Limber (E. Q. No. A36691) have been identified by Harold Morrison as Lepidosaphes rubrovittatus Ckll. This is apparently the first record of the presence of this insect in the New World. It was described originally from the Philippine Islands on one of the rose apples, Eugenia malaccensis, and was later reported from Ceylon on Hevea by E. E. Green, at first as a new species, L. fasciata, but subsequently under Cockerell's name.

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